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Diverse catches, muddy sediment samples and first results of physical oceanography

Last weekend we finally hauled in the first diverse catches, recorded beautiful seabed images, recovered muddy sediments, recorded the first scientific whale sightings and received the first oceanographic data. Despite the difficulties of finding good stations along the ice edge, the scientists on board were very excited about their first results.

Due to the ice conditions in the western Weddell Sea, we had to shift our research area. As a consequence, the benthologists, biologists whose expertise is the life on and in the seabed, have decided to study, alternatively to the original plan, organism communities in various environmental settings. These are characterized by different environmental parameters such as water temperature and nutrient level. By, for example, analyzing recent faunal assemblages in high and low nutrient environments, it is possible to estimate and predict responses in faunal composition and ecosystem functioning, when nutrient conditions in a similar area will alter from high to low nutrient levels or vice versa. If, in future, the marine environment of the Antarctic Peninsula experience further changes, these studies will allow scientist to estimate the resilience and the response of the marine biosphere. The first benthic stations were designed to support this concept. They are located in an area characterized by high Antarctic Weddell Sea conditions. Consequently, our first trawls contained examples of a diverse invertebrate fauna.

The main focus of the past week was on physical oceanographic and krill work. As part of our plan B, we choose stations along the ice edge and in areas where Polarstern was able to break through the ice without running the risk of getting stuck.

The objective of the oceanographic work is to study the distribution of the very cold and dense bottom water that has formed in the Weddell Sea and flows northward into the deep basins of the Southern Ocean. This bottom water has been systematically investigated over the past years and a slight increase in temperature has been observed. Even though too small to affect most organisms, this increase in temperature can already be of significance for the ventilation of the world oceans. In order to further investigate this trend, Mike Schröder and his team of researchers from the AWI and the Potsdam Institute for Climate Impact Research sample a set of defined oceanographic transects. These transects run across the areas with the most pronounced measured temperature increase and the highest predicted increase. We have already successfully sampled several stations with the CTD (a probe that measures Conductivity, Temperature and Depth). In addition to the continuously recording sensor probe, 24 water samplers each are attached to the CTD. The samples will also be analyzed for tracers by Oliver Huhn and his team from Bremen University. At the moment we are sampling transects that are partly in open water. But in order to get to some of the CTD stations, Polarstern has already done some serious icebreaking. In parallel to the oceanographic work, the krill-team samples the plankton with a Rectangular Midwater Trawl. This work will be presented in detail in one of the following weekly reports.

From Thursday to Friday, a gale forced us to stop our efforts for several hours and Capitan Pahl decided to seek shelter in a near-by dense patch of float-ice. The ice dampened the swell and we avoided having blocks of ice thrown at us by the waves. It was intriguing how little the ship moved even though the gale was hauling outside. Once the low-pressure system had passed and the seas had calmed down, we returned quickly to our station work and resumed the oceanographic transects.

Elephant Island has very steep cliffs. For this reason, there has never been a research station built on this island,

On Friday, we half circumnavigated Elephant Island. This is the legendary island where

the famous explorer Sir Ernest Shackleton and his crew were stranded after their ship sank in the Weddell Sea. Their wooden ship "Endurance" was literally crunched to pieces by the ice.

The correct link for the ZDF-Blog is: blog.zdf.de/ice-blog/

Unfortunately some of us have been affected by a wave of colds. Otherwise everything is fine on board. Only a little more sunshine would be nice.

Best regards,
Julian Gutt

Most of the crab-eater seals show marks from orca attacks. © T. Albrecht